

REMARKS

Reconsideration and allowance of the present patent application based on the following remarks are respectfully requested.

By this Amendment, claims 12, 19, 31-32 and 41 are amended and claim 25 is cancelled without prejudice or disclaimer to the subject matter therein. Claim 48 is newly added. Support for the claim language can be found throughout the initial disclosure. Accordingly, after entry of this Amendment, claims 1-24 and 26-48 will remain pending in the patent application.

Applicant respectfully notes that this is the second non-Final Office Action issued by the Office. Applicant respectfully notes that the piecemeal prosecution of this application places an undue and unfair burden on the Applicant and is not in line with the Office's own guidelines. *See* MPEP 707.02, 707.02(g), 904, 904.02 and 904.03. Per MPEP 707(g), Piecemeal examination should be avoided as much as possible. The Examiner ordinarily should reject each claim on all valid grounds available, avoiding, however, undue multiplication of references.

Claim Objections

In the Office Action, claims 31, 32 and 41 were objected to. Applicant respectfully traverses this objection. However, in order to advance prosecution of this application, claims 31, 32 and 41 have been amended by replacing the term "adapted" with the term "configured."

Accordingly, reconsideration and withdrawal of the objection to claims 31, 32 and 41 are respectfully requested.

Claim Rejections – 35 U.S.C. §101

Claims 19, 36 and 41 were rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. The rejection is respectfully traversed.

The Examiner contends that the language of the claim implies that what is being claimed is a system of software, per se, lacking the hardware necessary to realize. Applicant respectfully disagrees.

Contrary to Examiner's contention, the signalling protocol is tied to network switches (the hardware). The signaling protocol is implemented by the network infrastructure comprising the network switches. Furthermore, what is being claimed is a signalling protocol

which is a way of managing and handling a flow of messages between ports in a network when congestion occurs. In particular, the protocol requires the generation of the first message in one situation and then the subsequent sending of a further message to a further upstream port when some conditions are satisfied.

Furthermore, the machine-or-transformation test is not the sole test for patent eligibility under §101. The Court's precedents establish that although that test may be a useful and important clue or investigative tool, it is not the sole test for deciding whether an invention is a patent-eligible "process" under §101, *Bilski v. Kappos*, *Supreme Court of United States*, No. 08-964 (Decided June 28, 2010).

Accordingly, reconsideration and withdrawal of the rejection of claims 19, 36 and 41 under 35 U.S.C. §101, are respectfully requested.

Claim Rejections – 35 USC §103

Claims 1-17 were rejected under 35 U.S.C. §103(a) based on U.S. Pat. No. 6,657,963 to Paquette *et al.* (hereinafter "Paquette") in view of U.S. Pub. No. 2005/0088969 to Carlsen *et al.* (hereinafter "Carlsen"). Applicant respectfully traverses this rejection for at least the following reasons.

The present invention relates to the idea of "RECN" (Regional Explicit Congestion Notification). This is different from local explicit congestion notification. In RECN, congestion is notified regionally instead of just locally. Hence, in claim 1 for example, there is not only notification to an upstream port of congestion at a first port, but rather there is also notification to a further upstream port of the original downstream congestion, when one or more conditions are satisfied, i.e. the amount of data stored at the upstream port reaches some threshold. None of the prior art discloses the features of claim 1.

The Examiner contends that Paquette discloses sending a message to an upstream port connected to the first ingress or egress port indicating that congestion has occurred at a particular port. The Examiner refers to Figure 1 and the description at col. 3 in Paquette where there is description that if congestion occurs at a congested port 132 of the frame relay switch 130, the frame relay switch will generate a BECN indication that is sent upstream to the internetworking switch 126 (upstream port). The Examiner contends that Paquette discloses sending from the upstream port to a further upstream port a message informing the further upstream port of the congestion at the first ingress or egress congested port. Applicant respectfully disagrees.

In Paquette, the frame relay generates a BECN indication. The BECN indication is intended to inform upstream neighbors of the frame relay switch that the switch is overloaded. Paquette does not disclose, teach or suggest the RECN methodology claimed in claim 1 of the present application.

Indeed, informing upstream neighbors of the frame relay switch that the switch is overloaded is not a disclosure of sending from an upstream port to a further upstream port a message informing the further upstream port of congestion at the first ingress or egress congested port. Rather, it is simply, as is stated, a way of informing the upstream neighbors of the frame relay switch that the switch is overloaded. It should be borne in mind that the frame relay switch might have more than one internetworking switch to which it is connected and it is these switches that constitute the upstream neighbors.

Clearly, Paquette's networking system is not a RECN system, but rather is a LECN system. In Paquette, the congestion notification works on a stage-by-stage basis in that notifications to an upstream port or switch are in respect of congestion at the particular stage in question. The notifications in Paquette are not in respect of congestion at the original source (i.e., the "first ingress or egress port" as recited in claim 1).

Referring to Figure 5 of the present application, for example, the first stage (the communication between switches 78 and 80) is a LECN communication in that the port B0 is informed of congestion at the port C0. Accordingly, data routed via port B0 and destined for port C0 is stored at port B0. The subsequent communication from port B0 to port A0 is not about the congestion at port B0, but rather is about the downstream congestion (i.e. congestion at the first ingress or egress congested port) at port C0. This is described specifically at page 13, line 32 to page 14, line 15 of the specification.

The RECN system provides various benefits. For example, with reference to Figure 5 of the present application, if a communication between switch B78 and switch A76 was with respect to congestion at port B0 and data from port A0 of switch 76 that was ultimately destined for port C2 then this data could quite easily be communicated to this destination port. However if port A0 of switch 76 was informed that all communications via port B0 are to be stopped or reduced because of congestion at port B0 then this communication to uncongested port C2 would be delayed. Thus, the RECN methodology avoids such problems.

In Paquette, there is no disclosure of RECN. Paquette relates to the use of a translation strategy that is required to enable one protocol to react to congestion notifications

of another protocol. In the specific examples within Paquette, the problems arise due to communication between the frame relay switch 130 and the ATM switch 124.

As explained at col. 4, lines 20-27 in Paquette, reduction in egress traffic from the internetworking switch 126 will likely result in buffers within the switch 126 becoming increasingly full. When this results in a congested state within the switch 126, it will use the congestion indication means available in the ATM protocol to inform the ATM switch 124 that it is congested. In other words, it is informing the upstream switch of its own congestion and not of the original downstream congestion. The congestion notifications will “trickle upstream” as each switch is able to notify neighboring switches of its congestion, regardless of any protocol differences. This is consistent with LECN methodology.

This is further supported by col. 7, lines 27-30 in Paquette where it is stated that “the module 66 may then refrain from passing any congestion information upstream until it becomes congested itself due to the reduction in egress traffic.” Col. 8, lines 36-44 in Paquette provides further evidence that what is disclosed in Paquette is LECN methodology. In col. 8, lines 36-44 in Paquette, it is stated how the transmission rate corresponding to an egress path directed towards the source of a congestion indication may be reduced. It is stated that this itself can cause the module to become congested as ingress data directed towards the egress path consumes any buffering capabilities of the module. Once this congestion occurs, the module will propagate the congestion indication to an upstream source. In other words, it is waiting until the upstream port itself is congested before informing a further upstream port of any congestion. When it does, it is of the congestion at the upstream port and not at the downstream port. There is no disclosure either explicit or implicit of notification to the further upstream port of congestion at the downstream port.

Clearly, what is described in Paquette is a stage-by-stage LECN congestion notification methodology. Indeed, this is similar to the system shown in Figure 2 of the present application and described in the corresponding section of description.

Paquette does not disclose, teach or even suggest the subject matter recited in claim 1. Paquette does not disclose, teach or suggest that when congestion is detected at a first ingress or egress port sending a message to an upstream port connected to the first ingress or egress port indicating that congestion has occurred at a particular port and requesting storage at the upstream port of data packets destined for that port. Furthermore, Paquette does not disclose, teach or suggest in dependence on the amount of data packets destined for the congested port stored at the upstream port, sending from the upstream port to a further upstream port a

message informing the further upstream port of the congestion at the first ingress or egress congested port.

The Examiner concedes that Paquette does not disclose, teach or suggest congestion management within a switch or network of connected switches...when congestion is detected at a first ingress or egress port. However, the Examiner contends that Carlsen discloses congestion management within a switch or network of connected switches wherein each of the switches has a plurality of ingress ports and a plurality of egress ports. Applicant respectfully disagrees.

Carlsen fails to cure the deficiencies noted above in Paquette. Similar to Paquette, Carlsen relates to a local explicit congestion notification system (LECN). Carlsen discloses a congestion notification mechanism that provides a congestion status for all destinations in a switch at each ingress port. As stated at the bottom of paragraph [0009] in Carlsen, “if a destination port becomes congested, the flow control process determines which virtual channel on the ISL (Interswitch link) is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel.” In paragraph [0034] of Carlsen, it is described that the ingress memory subsystem assigns a received frame a packet ID or “PID”, that indicates the cell buffer address in the ingress memory subsystem where the packet is stored. In addition, in paragraph [0068], Carlsen describes how, if a particular data frame encounters a congested port within the downstream switch, the switch is able to communicate that congestion to the upstream switch by performing flow control for the virtual channel assigned to the virtual input queue. Furthermore, in paragraph [0073] in Carlsen, it is described how the flow control works in dependence on the occupancy of an output queue and in particular when a threshold is reached, an XOFF signal is generated to stop transmission of data from the ingress memory subsystem to the output queues in question. In paragraph [0088] in Carlsen, it is described the congestion notification methodology used. Specifically, an XOFF mask 408 is used which contains a separate status bit for all destinations within the switch, and each port has its own XOFF mask.

Carlsen does not disclose, teach or even suggest a RECN system. Clearly, Carlsen does not disclose, teach or suggest the subject matter recited in claim 1. Therefore, neither Paquette nor Carlsen, alone or in combination, disclose, teach or even suggest the subject

matter recited in claim 1. Therefore, Applicant respectfully submits that claim 1 is patentable over the purported combination of Paquette and Carlsen.

Claims 2-17 depend from claim 1. Therefore, claims 2-17 are patentable at least by virtue of their dependence upon claim 1 and for the additional subject matter recited therein.

For example, with respect to claim 2, claim 2 further requires the establishment of set-aside queues specifically for data packets that are destined for the congested port. In other words, it is not general storage of all traffic passing through the switch or port, but data that is specifically destined for the congested port. This provides some benefits. For example, the use of set-aside queues effectively decouples congested traffic from non-congested traffic. This ensures that congestion of certain particular ports within the network does not affect the operation of the network as a whole and there is no disclosure or suggestion of such set-aside queues for specifically identified data packets anywhere in the cited prior art. Neither Paquette nor Carlsen, alone or in combination disclose, teach or suggest the subject matter recited in claim 2.

Therefore, for the above additional reasons, Applicant respectfully submits that claim 2 is patentable over the purported combination of Paquette and Carlsen.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-17 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen are respectfully requested.

Claim 18 was rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen, furthermore in view of U.S. Pat. No. 7,286,552 to Gupta *et al.* (hereinafter "Gupta"). Applicant respectfully traverses this rejection for at least the following reasons.

Claim 18 depends from claim 1. Therefore, claim 18 is patentable over the purported combination of Paquette and Carlsen for at least the reasons provided above with respect to claim 1.

The Examiner concedes that the purported combination of Paquette and Carlsen does not disclose a pair of additional inverted bits...The Examiner relies on Gupta as allegedly disclosing a pair of additional inverted bits are used to delineate the start and stop positions of the active section of a turnpool...Gupta fails to cure the deficiencies noted above in the purported combination of Paquette and Carlsen. Gupta does not disclose, teach or even suggest the subject matter recited in claim 1.

Consequently, none of Paquette, Carlsen, and Gupta, alone or in combination disclose, teach or suggest the subject matter recited in claim 18. Therefore, Applicant

respectfully submits that claim 18 is patentable over the purported combination of Paquette, Carlsen and Gupta.

Accordingly, reconsideration and withdrawal of the rejection of claim 18 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen, furthermore in view of Gupta are respectfully requested.

Claims 19-25 were rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen. Applicant respectfully traverses this rejection for at least the following reasons.

Claim 19 is patentable over the purported combination of Paquette and Carlsen for similar reasons provided above with respect to claim 1. Neither Paquette nor Carlsen, alone or in combination, disclose, teach or suggest, *inter alia*, “a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port, the first message requesting establishment at the upstream port of a set aside queue for storing data packets received by the upstream switch destined for the source of congestion, the message including a token for storage by said upstream port, the protocol operating such that when said congestion clears, the established set aside queue is de-allocated and the corresponding token is passed downstream in the direction of the previously congested port, in which when a certain amount of data packets are stored within the set aside queue in said upstream port a message containing a token is sent by said upstream port to a further upstream port requesting establishment of a set aside queue at said further upstream port for storage of data packets destined for the first port at which congestion has been detected,” as recited in claim 19. Claim 19 requires the arrangement of RECN.

Therefore, Applicant respectfully submits that claim 19, and claims 20-25 which depend therefrom, are patentable over the purported combination of Paquette and Carlsen.

Accordingly, reconsideration and withdrawal of the rejection of claims 19-25 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen are respectfully requested.

Claims 26-28 and 35 were rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen. Applicant respectfully traverses this rejection for at least the following reasons.

Claim 26 is patentable over the purported combination of Paquette and Carlsen for similar reasons provided above with respect to claim 1. Neither Paquette nor Carlsen, alone

or in combination, disclose, teach or suggest the subject matter recited in claim 26. Claim 26 requires the arrangement of RECN.

Therefore, Applicant respectfully submits that claim 26, and claims 27-28 and 35 which depend therefrom, are patentable over the purported combination of Paquette and Carlsen.

Accordingly, reconsideration and withdrawal of the rejection of claims 26-28 and 35 and 35 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen are respectfully requested.

Claims 29-34 were rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen. Applicant respectfully traverses this rejection for at least the following reasons.

Claim 29 is patentable over the purported combination of Paquette and Carlsen for similar reasons provided above with respect to claim 1. Neither Paquette nor Carlsen, alone or in combination, disclose, teach or suggest the subject matter recited in claim 29. Claim 29 requires storage for storing details of the congestion tree comprising at least three connected ports in which in use, the switch is located. Neither Paquette nor Carlsen, alone or in combination, disclose, teach or suggest the features recited in claim 29.

The examiner indicates that the frame relay/ATM internetworking module 28 is operably coupled to a connection register which may be a flag used to store an indication that congestion has been detected. However, there is no disclosure of the storage of a congestion tree including at least three connected ports.

Therefore, Applicant respectfully submits that claim 29, and claims 30-34 which depend therefrom, are patentable over the purported combination of Paquette and Carlsen.

Accordingly, reconsideration and withdrawal of the rejection of claims 29-34 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen are respectfully requested.

Claims 36-38 were rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen. Applicant respectfully traverses this rejection for at least the following reasons.

Claim 36 is patentable over the purported combination of Paquette and Carlsen for similar reasons provided above with respect to claim 1. Neither Paquette nor Carlsen, alone or in combination, disclose, teach or suggest the subject matter recited in claim 36. Claim 36 requires the arrangement of RECN.

Therefore, Applicant respectfully submits that claim 36, and claims 37-28 which depend therefrom, are patentable over the purported combination of Paquette and Carlsen.

Accordingly, reconsideration and withdrawal of the rejection of claims 36-38 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen are respectfully requested.

Claims 39-41 were rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen. Applicant respectfully traverses this rejection for at least the following reasons.

Claim 39 is patentable over the purported combination of Paquette and Carlsen for similar reasons provided above with respect to claim 1. Neither Paquette nor Carlsen, alone or in combination, disclose, teach or suggest the subject matter recited in claim 39. Claim 39 requires the arrangement of RECN.

Therefore, Applicant respectfully submits that claim 39, and claims 40-41 which depend therefrom, are patentable over the purported combination of Paquette and Carlsen.

Accordingly, reconsideration and withdrawal of the rejection of claims 39-41 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen are respectfully requested.

Claims 42-47 were rejected under 35 U.S.C. §103(a) based on Paquette in view of Carlsen, furthermore in view of Gupta. Applicant respectfully traverses this rejection for at least the following reasons.

Claims 42-47 depend directly or indirectly from claim 1. Therefore, claims 42-47 are patentable over the purported combination of Paquette and Carlsen at least by virtue of their dependence upon claim 1 and for the additional subject matter recited therein.

Gupta fails to cure the deficiencies noted above in claim 1. Gupta does not disclose, teach or suggest the subject matter recited in claim 1.

Consequently none of Paquette, Carlsen and Gupta, alone or in combination, disclose, teach or suggest the subject matter recited in claims 42 and 47. Therefore, Applicant respectfully submits that claims 42-47 are patentable over the purported combination of Paquette, Carlsen and Gupta.

Accordingly, reconsideration and withdrawal of the rejection of claims 42-47 under 35 U.S.C. §103(a) based on Paquette in view of Carlsen, furthermore in view of Gupta are respectfully requested.

Claim 48 has been added. Claim 48 depends from claim 2. Therefore, for at least the reasons provided above with respect to claim 2, Applicant respectfully submits that claim 48 is patentable.

CONCLUSION

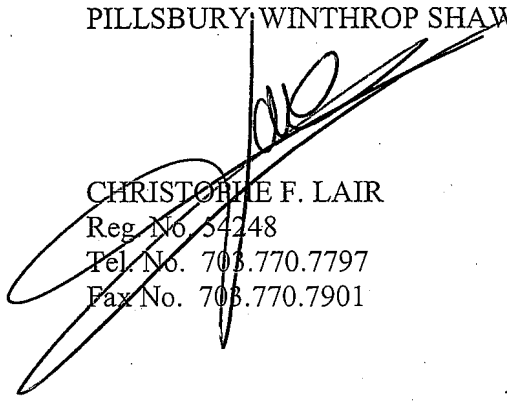
Applicant has addressed the Examiner's rejections and objections and respectfully submits that the application is in condition for allowance. A notice to that effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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